

defect, that one most disqualifying from a Naval standpoint is listed.

Defective vision caused the highest percentage of rejections. The minimum allowed is 15/20 corrected by glasses to 20/20. The fraction 15/20 denotes that the applicant must stand 15 feet away from the chart in order to correctly read standard type normally seen at 20 feet.

Color blindness was present in 6% of the rejects, or 1.4% of all applicants. The latter figure is considerably lower than that obtained by Jeffries who examined 19,183 males and found 802 color blind, or 4.18%.<sup>1</sup>

A committee of the Ophthalmological Society of London examined 14,846 males and found 617, or 4.15%, color blind.<sup>1</sup>

Gatewood states that in three fiscal years between 1895 and 1906, out of 74,300 applicants examined for first enlistment, 3.2% were color blind.<sup>1</sup>

It is interesting to note that color blindness appeared in three brothers of one family and two in another in our series.

Care was taken not to condemn as color blind one who was only color ignorant. The applicant was given a colored skein to match rather than told to pick out shades of a certain named color.

As all the men were volunteers and anxious to enroll, simulation in eye examinations may be practically ruled out. By using various combinations of letters on the test chart, chances of a candidate having learned certain lines by rote were avoided.

Regarding heart murmurs, conscientious attempt was made to rule out the functional varieties. Many applicants found with heart murmurs were submitted to a subsequent examination for final decision. The history of diseased tonsils and previous rheumatic attacks could be elicited in many of the heart rejects.

Small varicoceles were not considered as cause for rejection. Only in cases where the varicocele approached the size of the testis were the applicants turned down. In all cases where the applicants were passed with varicocele, permission for subsequent surgical treatment if indicated, was obtained.

Many were rejected on account of insufficient teeth. The Navy regulations call for at least twenty sound teeth with four opposed molars and incisors respectively. Properly filled teeth are counted as sound.

The percentage of flat feet rejects was rather small. The method of gauging flat-footedness is as follows:

"The height of the arch is measured as the distance from a line drawn between (a) the lower border of the internal malleolus and (b) the lower tubercle on the head of the first metatarsal (Feiss line) to (c), the tubercle of the scaphoid, which distance should not exceed one-half inch. This measurement is relative and is simply a measurement of proportion in the average foot." Of course additional signs are looked for, such as attitude in standing and walking; distribution of weight as shown by applicant's shoes; contour of

feet side by side with the two internal malleoli and metatarso-phalangeal joints touching; range of motion, especially adduction or inversion of foot, and history of pain or previous arch trouble.

Underweight and underheight were the causes of many rejections. The minimum height accepted in the Navy is 64 inches, with a corresponding weight of 128 pounds. In some cases where the deficiency was not too great and the applicant otherwise desirable, acceptance was gained by waiver. Those temporarily underweight were asked to appear for subsequent examination.

Of the cases listed as post-operative hernias, the great majority followed appendectomies.

Any case of appreciable change in breath sounds found in the lung examination was regarded as suspicious and either rejected as suspected tuberculosis or re-examined subsequently in case of an acute bronchitis.

Hemorrhoids were mostly of the external type and a cause of rejection only when large.

Impediment of speech consisted mainly of stuttering and this was considered sufficient cause for rejection. A stuttering "Jackie" is usually subjected to painful ridicule by his more fortunate shipmates.

Cardiac arrhythmias caused various rejections. In some cases this was attributed to overuse of tobacco, in others to pure nervousness. In none, was any thyroid enlargement found.

Applicants with undescended testicles were rejected on account of the possibility of future complications.

Among the five cases rejected for atrophic testicles, three gave as causes previous attacks of mumps.

No routine blood examination was done for syphilis. Those rejected showed unmistakable clinical signs.

## ORIGINAL ARTICLES

### UROLOGICAL DIAGNOSIS IN GENERAL PRACTICE.\*

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The recognition at an early stage of almost any urological disease, whether in man, woman or child, and immediate institution of proper treatment would give a high percentage of complete cures; would prevent many chronic and hopeless complications, and would greatly lower mortality. Many urological conditions may be recognized without the need of any special procedure of examination. In the majority, however, particular methods are required before a diagnosis can be made. It is the purpose of this paper to call attention to the value of a properly performed routine urological examination on the part of the general practitioner, which will enable him not only to diagnose earlier those conditions possible of diagnosis by such an examination, but also to refer at an earlier date particular cases requiring a more complete urological study. The late recognition of many chronic genito-urinary ailments is

<sup>1</sup> Gatewood—Naval Hygiene, p. 707.

\* Read October 2, 1916, before the Fresno County Medical Society, Fresno, Cal.

often, to be sure, the fault of the patient in not seeking medical advice. For example, stone may be present in the kidney for years, and the patient have no symptomatic knowledge of it; but when that patient finally consults a doctor for the pyuria that results and is then treated over a long period for a cystitis, who is to blame for the completely destroyed kidney? In case of bilateral silent stones there will result irreparable damage to both kidneys. The following case (Case I) is an example:

A young man at the age of 26 was told by his doctor that he had pus and blood in his urine. He is now 38. Pus has been continuously present in his urine for twelve years. He has seen, in these twelve years, many different doctors and has been variously treated. He has had dilute hydrochloric acid for epigastric pain and bladder irrigations over prolonged periods for cystitis. He has never had renal colic or lumbar pains. Recently an X-ray examination, the only one he has ever had, showed enormous bilateral stone casts of large pyonephrotic kidneys. Had these stones been recognized when pus was first found in the urine, as they would, had the proper routine examination been made, twelve years of gradual destruction of both kidneys would have been saved.

For the purpose of the present consideration, the close anatomical and functional association of urinary and genital cases permit of one general preliminary examination to cover all cases. It is on the indications of such a preliminary study that more detailed investigations of either group are made. Such a routine should include a detailed urinary and genital history, urine examination, an examination of the external genitalia and, in the male, a rectal examination. The indication of a lesion of the upper urinary tract would then require additional procedures which would differ from that for a lesion of the lower urinary tract. Certain routines, for teaching purposes as well as to insure thoroughness, have been established in the University of California clinic. In the study of kidney cases renal X-ray and functional study are required as preliminary to the more special examination of cystoscopy, wax-tipped exploration, separate functional study, pyelography and so forth. Examination of cases with acute and chronic lesions of the lower urinary and genital tract also are followed in a routine way. These methods might be advantageously adapted in general practice and are as follows:

#### TECHNIC OF EXAMINATION IN ACUTE URETHRITIS.

- I. Examination of External Genitalia.
- II. Examination of Urethral Discharge. (Make very thin smear. Use Gram's Method.)
- III. Examination of Urine:
  - a. Three Glass Test.
  - b. Young's Seven Glass Test when indicated. Note: No patient with profuse discharge is ever to be instrumented.

#### TECHNIC OF EXAMINATION IN CHRONIC INFECTIONS OF THE URINARY TRACT.

- I. Examination of the External Genitalia.
- II. Examination of Discharge, if any is present.
- III. Examination of Urine:
  - a. Three Glass Test.
  - b. Seven Glass Test.

#### IV. Rectal Examination.

- a. Note sphincter tone and absence or presence of hemorrhoids.
- b. Outline and examine prostate. Note the form and consistency of the right and left lobes, the character of the median furrow and notch, and the recto-prostatic sulci, the existence of lateral adhesions, and the presence of areas of induration, nodulation or stony hardness.
- c. Outline and examine the seminal vesicles. Note the relative distention, consistency and the character of areas of induration or nodulation. Palpate for vasa differentia. Note character of intervacular area.
- d. Examine microscopically secretion obtained after massage. (Where the vesicular secretion is to be examined separately from the prostatic secretion, Cabot's method should be used.)

#### Cabot's Method:

1. Urethral irrigation and bladder filled with irrigating fluid.
2. Prostate massaged, care being taken not to strip the vesicles. Secretion obtained is the prostatic secretion. Have patient void.
3. Repeat urethral irrigation and bladder distention.
4. Strip the vesicles. The secretion obtained will be vesicular secretion.
5. Have patient void and examine the secretion in the voided specimen, if none obtained by the above stripping.

#### V. Urethral irrigation preparatory to instrumental examination of the urethra.

#### VI. Examine anterior urethra with a bougie a Boule. (Begin with 29F and use smaller sizes as necessary. Note size of meatus. As a rule, meatotomy indicated when smaller than 26F.)

#### VII. Examination of posterior urethra with sounds. (Begin with small size, usually 22F and gradually increase the size to 26F or 28F. Never use force. Have sound well lubricated.)

#### VIII. Examination with the endoscope. (This examination should usually be preceded by a period of dilatation in order to get the urethra accustomed to instrumentation.)

Three of the more preliminary of the steps in a urological examination, namely, urine, rectal and X-ray, are worthy of detailed consideration since their neglect, or faulty interpretation, causes the greatest number of mistakes in diagnosis.

The viewpoint of the urologist in regard to the information sought, differs somewhat from the ordinarily held in making an examination of the urine. Pus, blood and the type of infection, take precedence in his mind over specific gravity, albumen, sugar, and casts. In the ordinary examination of the urine a few pus or blood cells and an occasional organism have little significance, and are too readily explained as a urethral or vaginal contamination. Pus and blood, unless they produce macroscopic cloudiness, rarely attract particular attention, and even then, if of periodic and short duration, are wholly disregarded. The adoption of the urologist's point of view, that pus, blood, and bacteria, no matter how small in amount are pathological, would often save much valuable time in diagnosis. The method of collection is of the first importance in an examination of the urine for these evidences of disease. Morning specimens or a portion of the 24-hour specimen brought to the office by the patient have no value. The urine must be freshly

FIG. I.

## FINDINGS OF THE THREE AND SEVEN GLASS TESTS (after Young).

Portion of Urethra.	Discharge at Meatus.	3 glass test.			Young's 7 glass tests.							Prostate on palpation.	Secretion.
Pendulous Urethritis	Present	1	2	3	1	2	3	4	5	6	7	Normal	Normal
		S	—	—	S	—	—	—	—	—	—		
Bulbous Urethritis	Absent	S	—	—	—	—	S	—	—	—	—	"	"
Posterior Urethritis without Prostatitis	"	S	—	—	—	—	—	—	S	—	—	"	Pus cells in small number
Posterior Urethritis with Prostatitis	"	S	S	—	—	—	—	—	S	S	—	Indurated or enlarged	Pus cells in great number
Prostatitic without Urethritis	"	—	—	S	—	—	—	—	—	—	S	"	"
Seminal vesiculitis	"	—	—	C	—	—	—	—	—	—	C	Seminal vesicle indurated—enlarged	Massage of vesicle gives pus
Cystitis and Pyelitis	"	C	C	C	—	—	—	—	C	C	C	Prostate may or may not be involved	May or may not contain pus

S = Shreds.  
C = Cloudy.  
— = Clear.

voided and examined immediately. Cloudiness may be due to pus, blood, bacteria or, in the male, spermatozoa, and to phosphates, urates or mucus. The microscope is the best test for the first four. A little acetic acid clears phosphatic cloudiness. Heating dissolves urates and standing a few minutes identifies mucus. A knowledge of the character of bladder urine uncontaminated by any secretions of the urethra or accessory organs is wanted in every case, and usually may be easily obtained without the necessity of catheterization. For this purpose the three glass test is a valuable method in both men and women, and if the external genitalia have been previously cleansed the third glass will give urine suitable even for cultural study, except of course in the male when cystitis or vesiculitis is present. Fig. I will show the findings of the three and seven glass tests. The seven glass test of Young is more accurate for the identification of the source of pus in the lower urinary tract, but is indicated only when there is a history or evidence of disease here. After the exclusion of these accessories as the source, the finding of any pathological elements in the bladder urine raises the problem of determining its portal of entry. There are a number of serious kidney lesions which are evidenced at first only by bleeding, and have no associated signs or symptoms. The only evidence of stone in the kidney or ureter may be a few red blood cells in the urine. The hematuria of renal tumor is periodic and is its commonest initial sign. Usually, however, it is of short duration, which fact should not be overlooked. A large percentage of pyurias are treated for cystitis without proper investigation. Usually cystitis is present in these cases,

but the cystitis is secondary and will clear up without treatment upon the cure of the primary focus. Primary cystitis in the male sex is practically unknown. In women and female children infections not infrequently ascend the relatively short urethra. Of a number of cases of supposed pyelitis and pyelo-cystitis in girls between two and eight years old, which have been referred for examination recently, in four, cystoscopic examination with ureteral catheterization found the kidneys to be free of pus and infection, which was shown to be in these four cases confined to the bladder. But even in women and children primary cystitis is the exception. It is a grievous error, therefore, to institute any treatment for cystitis without first ascertaining the condition of the urinary tract below the bladder, and if found negative a thorough investigation above the bladder should be made. Fig. II shows the possible source of pus in the female. In the male there are added the accessory genital sources, such as the prostate, seminal vesicles, Cowper's glands and the glands of Litre.

The bacteriology of urinary infections is fairly simple. The colon bacillus is found in from 70% to 80% of renal infections and from 50% to 60% of vesical infections. Staphylococci are present in about 10% and streptococci and the proteus group of organisms are next in about equal frequency. Tubercle bacilli occur probably in 5%. The other organisms reported, of which there is a very long list, are extremely uncommon so that five organisms cover 95% of urinary infections; namely, bacillus coli communis, staphylococcus, streptococcus, proteus vulgaris and tubercle bacillus. The first and last always occur in acid

urines, whereas the proteus group decompose urea and produce a strongly alkaline urine so that a knowledge of urinary reaction with the findings of a stained smear will usually make a bacteriologic diagnosis. A pyuria without demonstrable organism upon ordinary culture media, that is, so-called sterile pus, is significant of tuberculosis or gonorrhoea. A sterile pyuria is often kept up indefinitely in women by gonorrhoeal trigonitis. Tubercle bacilli, however, should always be most carefully excluded in every case with sterile pus. An exceptional form of true sterile pyuria has been recently seen in which the pus invaded the bladder from a metastatic lympho-sarcoma.

The frequency in early life of gonorrhoeal complications and in later life of prostatic disease warrants a thorough rectal examination as a routine part of every physical, excepting most cases of acute urethritis. The palpation of the gland as usually conducted forms a most incomplete examination. A definite procedure should be adopted, as has been outlined above, and the furrow, notch, the depth of the lateral sulci and lateral lobe characteristics noted. The region of the vesicles and vasa should be explored, as well as the inter-vesicular area. In gonorrhoeal infections a rectal examination has little or no value unless controlled by microscopical examination of the secretion. Massage of the prostate followed by an irrigation and then by stripping the vesicles will usually give the prostatic and vesicular secretions for separate examination; but Cabot's technic, as given above in table I, is often more satisfactory. A warning seems in place here against the faulty interpretation of small amounts of pus on the first examination. If the secretion shows no pus after a thorough massage it is safe to consider the prostate and vesicles negative, but a few pus cells should be regarded with suspicion and all such cases should be made to return in one or two days for a second massage and stripping. It not infrequently happens that on the second examination the secretions will be found loaded with pus. The frequency of vesiculitis as a cause of cystitis or pyuria should also be emphasized. I recall two cases which have had pronounced pyuria for years, in whom no other focus than a chronic vesiculitis can be found. The response to treatment in both has been very satisfactory.

Prostatism is a condition which can be recognized early by the general profession. A rectal examination should never be neglected in a man over fifty. It is not always possible, however, to recognize hypertrophy by a rectal examination and there are many other conditions which will give symptoms of obstruction to urination. The term "prostatism" applies particularly to chronic diseases of the prostate which produce obstruction. These are hypertrophy, atrophy and cancer. A stone, tumor or diverticulum of the bladder may give identical symptoms. Acquired or congenital stricture of the urethra, and urethral stone, or tumor may give a similar picture. Disease or injury of the spinal cord should always be carefully excluded, particularly early tabes dorsalis and gen-

eral paresis. It is well to remember that many inflammatory conditions, such as cystitis, prostatitis and posterior urethritis often cause acute or temporary urinary disturbances. Atrophy of the prostate, synonymous with contracture of the vesical neck or median prostatic bar, usually occurs in men under 50. The diagnosis is based on symptoms of prostatism, negative rectal finding, residual urine and a certain cystoscopic picture. Cancer of the prostate coexists with hypertrophy in 20% of the cases and hypertrophy is present in 75% of prostatic cancers so that it is seen that the majority of cancers will have an associated hypertrophy. Cancer always attacks primarily the posterior lobe, and the diagnosis depends almost solely upon the evidence of a rectal examination. The cancerous invasion produces a characteristic stony hard induration quite different from that of tuberculosis which is nodular, and rarely primary. This stony hard induration, however, is sometimes simulated by chronic inflammation. The importance of an early recognition of prostatic cancer lies in the fact that the only possibility of a surgical cure depends upon radical removal before the disease has invaded other tissues. When this has occurred only a palliative operation can be performed for the purpose of relieving the urinary obstruction, and these cases may all eventually die of carcinomatosis. Of twelve cases of cancer of the prostate, personally operated in the last three years, not one has sought treatment early enough to permit of radical removal.

It is estimated that 35% of all men over 55 years of age have hypertrophy of the prostate but only 15% of these have symptoms. This 15% should have much more intelligent consideration than they get at present. The majority now are labeled as enlarged prostatics and left to a life of progressive misery until retention or some complication finally demands relief. When symptoms once begin the disease has been found to be progressive. Casper considers this progression in three stages: (1) premonitory, (2) retention without dilatation, and (3) retention with dilatation of the bladder. Where infection occurs, however, as it may quickly do when residual urine is present, the clinical picture may be quite different. An infection supervening in the second stage will usually result in a contracted bladder and operation with a contracted bladder, although it may relieve the obstruction, will still leave frequency of urination. Infection present with back pressure quickly travels up the ureters and a pyelonephritis or, with much back pressure, a pyonephrosis will result. It is of considerable importance to the patient, therefore, that back pressure be relieved before infection occurs or before bladder dilatations and ureteral and renal pelvic dilatations have occurred. At the same time it is not advisable that every old man in whom hypertrophy of the prostate has been discovered, should be operated. The question of the opportune time for operative intervention is therefore of considerable importance. In the diagnosis rectal examination will recognize most forms but there are certain partial and intravesical hypertrophies in which it is unreliable. A valuable aid in

diagnosis is urethral catheterization. This will determine the amount of residual urine, the capacity of the bladder, and the length of the urethra. Normally there is no residual. The normal bladder capacity is from 400 cc. to 500 cc. The normal length of the urethra is from seven to eight inches. Hypertrophy of the prostate which gives symptoms, almost invariably shows a residual which will vary according to the stage of the disease and the type of the hypertrophy. The catheter determines also contraction or dilatation of the bladder. The length of the urethra is almost invariably increased. This increase occurs between the verumontanum and the neck of the bladder. On account of the variations in the length of the anterior urethra in different individuals a measurement of the length of the posterior urethra is therefore of more value than a measurement of the length of the whole urethra. In passing a catheter the point when it strikes the external sphincter can be noted, and the point when urine first appears which denotes its passage through the internal sphincter also noted. The difference between these two is the length of the posterior urethra which normally measures from  $3\frac{1}{2}$  to 4 cm. and when hypertrophy is present may measure two to three times this length. Very often hypertrophy distorts the posterior urethra sufficiently to render catheterization difficult. This difficulty is easily overcome with the use of a Coude or a double elbow (bicoode) catheter or a curved mandrin. A very valuable procedure at the time of catheterization is to make a rectal examination while the catheter is in place. Normally the catheter may be felt almost throughout the length of the prostatic urethra because of the shallowness of the prostatic furrow. In hypertrophy the degree of thickening between the urethra and the examining finger is readily appreciated. Of course an anterior lobe hypertrophy or a subtrigonal or subcervical hypertrophy might easily be missed by such an examination. A urethral sound is more resistant and better for estimating this urethro-rectal relationship. The cystoscope of course is invaluable in doubtful cases and particularly in determining accurately the form of hypertrophy, whether general or confined mostly to a median, an anterior or lateral lobe. Rectal examination and the intelligent use of a catheter will, nevertheless, diagnose practically every case.

It will not be possible to discuss at length here the question of when is the proper time to operate a prostatic. There is no question that the mortality results of prostatectomy would be very markedly lowered from their present comparatively low point if all cases came earlier for operation. In the seventy cases which have been personally treated almost one-third had had symptoms longer than ten years, while less than one-third had had symptoms less than five years. Operation in a man who presents a good clinical risk is very benign and the mortality in this type of case would be very low. To advise every man who presents definite symptoms and a residual urine to have an operation would seem justified.

The importance of x-ray examination in urologi-

cal conditions is principally for the determination of the presence of renal, ureteral or bladder calculi. It is a sound practice to refer every case with doubtful pyuria, hematuria or renal pain for an x-ray examination but it should be emphasized that the study is not complete when a negative report comes back. The x-ray plate will not recognize all renal stones, and is much more inaccurate in the recognition of ureteral stones. About 20% of stones in the ureter fail to cast a shadow in the x-ray plate. Fig. II shows graphically the position of twenty-eight stones shown by the x-ray (series of Geraghty and Hinman). It is seen by this diagram that none of these stones occurred in that portion of the ureter over the shadow of the sacrum, and it is very probable that it is in this portion that the x-ray misses the greater number of ureteral stones. A negative x-ray finding, therefore, is not complete and all cases in which this condition is possible should be referred for a thorough urological examination.

The following few cases will illustrate some of the serious complications resulting from delay in urological diagnosis. Many of the cases would have been recognized early had such a routine procedure as already outlined been followed.

#### Case I—Bilateral Renal Calculi:

Ed. F. B. Aet 38. Married. P. C. No. 226. U. C. No. 11565. Admitted June 15th, 1916. Discharged July 31st, 1916. Operation June 19th, 1916. Left nephrotomy. Large coral calculus removed (Fig. III). Patient upon admission had no particular complaint but came to the hospital for examination because of the finding of pus in the urine by Dr. McVey of Oakland.

Family history, negative.

Past history: Diphtheria (10), pneumonia (11), measles (19), mumps (22), right herniotomy (26), left radical mastoid (30). Present illness shows no definite onset. Patient has never had lumbar pain or discomfort. No urinary disturbance. The last few years has had to get up once at night but no difficulty or burning. About twelve years ago, when examined by a physician in Virginia, he was told that his urine contained pus and blood, some albumen and a few casts. Since that time he has occasionally seen blood cells himself in his urine. In the fall of 1912 he had attacks of non-radiating epigastric pain, relieved by hot applications and by vomiting. Took dilute hydrochloric acid, as prescribed by a physician, which relieved the attacks for three or four months.

P. E. Heart negative. Neither kidney palpable. Urine, June 16th, specific gravity 1012, acid. Trace of albumen; no sugar; hyaline and granular casts; many red blood and pus cells; numerous motile bacilli and staphylococci.

Phthalein test, first hour 36%, second hour, 22%.

On June 18th, phthalein test, first hour 36%, second hour 20%.

On June 20th, first hour 25%, second hour 15%.

On June 29th, first hour 24%, second hour 22%.

Blood count, 80% hemoglobin, 9,200 white blood cells.

X-ray examination, June 16th, shows large coral-shaped bilateral stones in kidneys (Figs. IV and V).

Cystoscopic examination shows many pus cells on both sides and motile bacilli found in both specimens. Phthalein appeared on the left in four minutes, right in five and one-half minutes. Thirty-minute output on the left, 15%, thirty-minute output on the right, 15%. At operation the left side was operated on first because the X-ray showed this side to have a smaller stone and the functional

study indicated it to be the better kidney. At the operation the kidneys were found to be very large and sac-like. Perirenal tissues were many times thicker than normal and were found to be very adherent at its upper pole so that it was delivered with difficulty. The stone shown in Figure III was removed through a longitudinal incision of the cortex. At the upper pole of the kidney a small abscess pocket was opened and there was a smaller abscess towards the mid part of the kidney. These were opened and curetted. There seemed to be very little secreting cortex left, but the two halves were sutured together with a few loose chromic gut sutures, enough to control bleeding and the kidney put back in place.

This case has done remarkably well following operation, considering the extreme pyonephrotic kidneys he has to live on (the lumbar wound has been closed for many weeks). Total phthalein test 10/17; first hour 38%, second hour 20%. The urine, however, has been, and is still, loaded with pus. Culture shows bacilli of colon and mucosus capsulatus groups, of which a vaccine has been administered. The patient is actively at work (principal of large grammar school).

Note: The very grave prognosis of this case would have been different had these kidney stones been recognized twelve years earlier, as they would have had the above routine method of X-ray examination been followed.

Case II. Enlarged prostate with median bar and chronic urinary infection. G. B. Aet 63. P. C. No. 66. Admitted August 12th, 1915. Discharged September 29th, 1915.

Family history and past history, irrelevant.

Complains of pain in the region of the bladder, frequency of urination and general loss of strength.

P. I. For more than 20 years patient has had gradually increasing frequency in urination. Eight years ago had acute attack of pyuria with marked burning and pain on urination, which lasted for ten days. A year later frequency and burning recurred in exaggerated form and he would get up as often as eight or nine times at night. Would often be unable to void until he had gotten into a hot Sitz bath. These severe attacks recurred about every year, sometimes lasting two or three months. In between attacks there would still be great frequency, pain and general weakness and the urine has been continuously cloudy and ropy. Has lost about 20 pounds in weight in three years.

P. E. High pitch, blowing systolic murmur at apex, transmitted to the axilla. The abdomen is negative. Urine is loaded with pus; many organisms; few red blood cells; hyaline and granular casts. Phthalein test, August 17th, first hour 13%, second hour 22%. Phthalein test, September 28th, first hour 5%, second hour 10%.

Rectal examination: Prostate is slightly enlarged, soft and smooth. Median furrow and notch partly obliterated. Cystoscopic examination: Residual 150 cc. Bladder capacity 750 cc. Cultures of bladder urine show streptococci and pyocaneus. Bladder wall marked by trabeculated, several cellules present and back of the end of the trigone is a very deep cellule. Marked granular cystitis. Ureteral orifices slightly dilated. Catheterization of ureters shows marked pyelonephritis on both sides. Inspection of the vesical orifice shows perfectly smooth, round outline. No sulci seen. Appearance of collar hypertrophy. There is definite thickening between the shaft of the instrument and the examining finger in the rectum.

Operation, August 19th. Perineal prostatectomy, moderately hypertrophied gland being removed with the curette and the vesical orifice was opened with Young's punch through the perineum. Convalescence uneventful. Control of urination on the 22nd. First voided through the urethra on the 26th. Discharged on the 29th of September. Very little leakage through the perineal fistula. Perfect

control of urination. Urine still loaded with pus and organisms. For the past two weeks has been getting vaccine treatment for the kidney infection. Patient returned home and instructed to use Urotropin and bladder irrigations. Last heard from in August, 1916. Urine was still cloudy but the general condition was very much improved. Perfect control of urination. Gets up at night one to three times and urinates every two to three hours during the day.

Note: This case undoubtedly had a contracture of the vesical neck which began to give troublesome symptoms about his 45th year. This was followed by residual and infection and later a small hypertrophy. Recognition of the condition 20 years earlier would have prevented many years of suffering.

Case III. Congenital vesical diverticulum.

G. M. Aet 57. Surgical number 10961. Admitted March 9th, 1916. Operated June 2nd. Died June 24th. Complaint: Frequency and painful urination. Family history, negative. Occupation, book binder. No illness before P. I. Twenty years ago was treated for premature ejaculations by dilatations with cold sounds. Following this treatment had complete incontinence for about two months for which he had to wear a urinal. Completely regained control of urination but with marked frequency and urgency, every hour during the day and four to five times at night. Would have considerable pain in the bladder both before and after urination and noticed at this time that the urine was markedly cloudy. This condition has been continuous up to the present and has gradually grown worse. Four years ago was unable to void when the desire came and forcibly held his urine for some little time when suddenly was seized with severe pain low down in the back. This pain persisted for about six hours and since then his condition has been as before; marked frequency, urgency and painful urination. Five months ago first noticed blood in the urine, which persisted for two days and in two weeks had a second attack of hematuria, since when there has been no bleeding. Status present: Urinates every hour during the day and four to six times at night. Marked pain before and after urination; marked urgency. Urine loaded with pus. Patient has had pronounced intestinal symptoms for several years; constipation, meteorism and abdominal cramps.

P. E. Heart slightly enlarged. Soft systolic murmur at the apex transmitted to the axilla. Blood pressure 110-70. Abdomen, negative. Neither kidney palpable. X-ray of the kidneys negative. Urine. Three glass test shows cloudiness, loaded with pus and organisms; motile bacilli and cocci; no casts. Urine culture shows pyocaneus. Prostate not enlarged per rectum. Median furrow and notch are marked. No deep notch to the sides. Phthalein test, March 9th, first hour 22%, second hour 37%. March 10th, first hour 10%, second hour 30%. This test was done with the retention catheter. March 11th, urea nitrogen in the blood 15.1 per 100 cc.

Cystoscopic examination shows no intravesical enlargement of the prostate. In the mid line just behind the trigone is seen the mouth of a diverticulum. Bladder wall is markedly trabeculated and in the region of the right ureter are three well marked cellules. Rectal examination with the instrument in the bladder reveals no thickening between the shaft of the instrument and the examining finger. There is no median bar formation or contracture of the vesical neck. The right ureter was catheterized. Not possible to pass the catheter on the left side. Phthalein appeared in six minutes, first 15 minutes output 10%, second 15 minute output 10%. A ureteral catheter was inserted and the patient taken to the X-ray room. Bladder filled with collargol with the patient in the Trendelenberg position, shows picture in Figure VI. The bladder was then emptied and



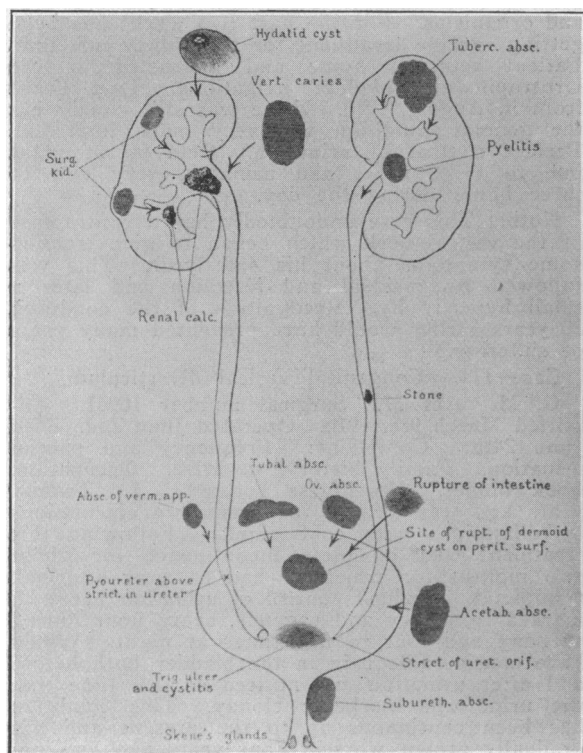


FIGURE II (From Kelly & Burnham).

Diagrammatic representation of possible source of pus in the female. Pyonephrosis and pyelonephritis should be included. In the male the lower genital tract is much more frequently responsible, the analogue of Skene's glands being prostatitis, seminal vesiculitis, Cowperitis and Litritis. Urethritis is potent in both, but particularly posterior urethritis in the male.

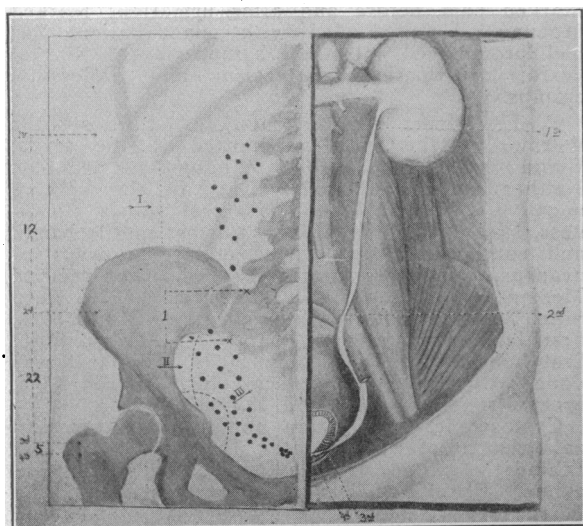


FIGURE III.

Graphic representation of the ureter with its four anatomical points of narrowing. Stones that are missed in the X-ray occur most frequently in that portion behind the shadow cast by the sacral wing. As shown on the right half of diagram, there were no stone shadows in this portion of the thirty-nine cases analyzed (Geraghty and Hinman). In the same series six additional cases of ureteral stone, which failed upon repeated examination to cast a shadow in the X-ray plates, were identified by means of the wax-tipped catheter. As seen in the diagram, five, or fifteen per cent. of the ureteral stones occur in the intramural portion, readily accessible for removal by cystoscopic methods.

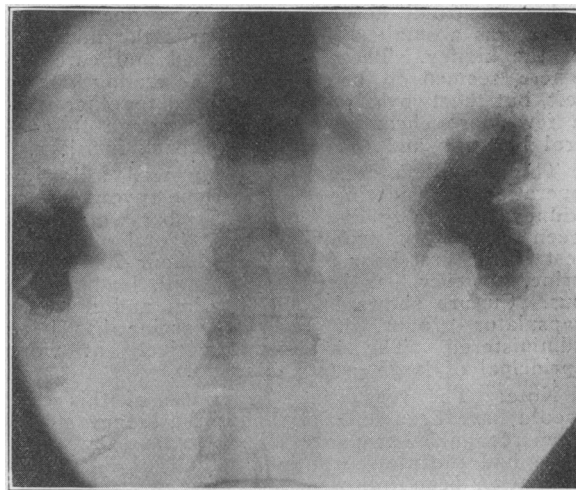


FIGURE IV.

X-ray picture of Case I, showing pelvis and calyces of both kidneys as beautifully outlined by calcification as when injected with Collargol or Thorium. The smaller stone in the better kidney was removed and patient will return later for removal of the left-sided stone.

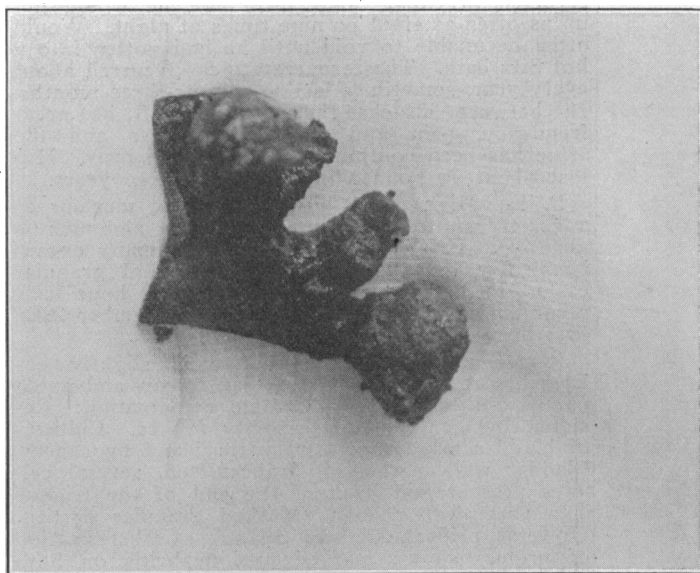
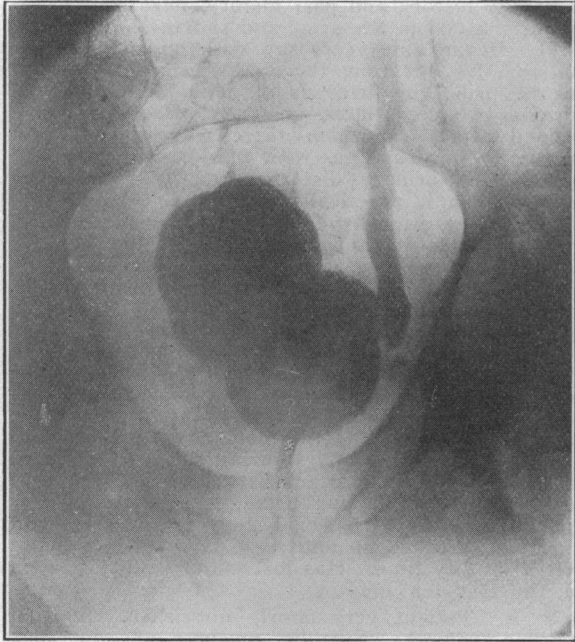
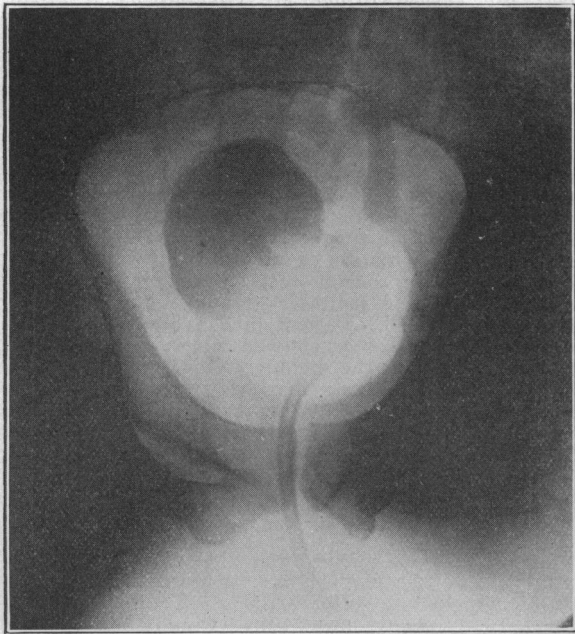


FIGURE V.

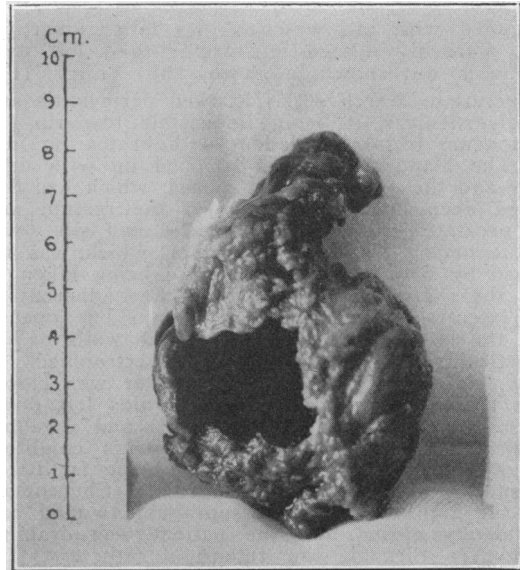
Photograph of stone removed by Nephrotomy from right kidney of Case I. The stone presented no line of cleavage by fracture as is common in such large renal calculi, the result presumably of bending of the kidney from movement in respiration.



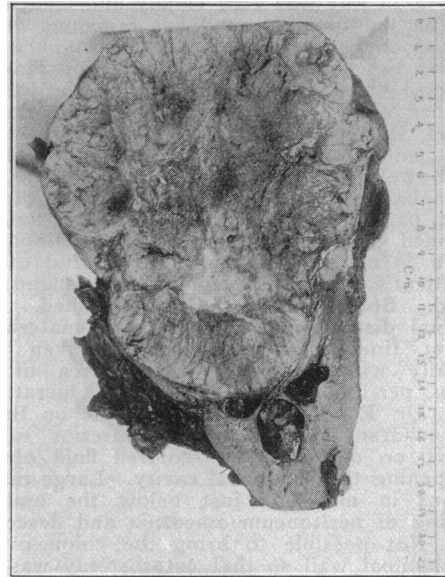
**FIGURE VI, CASE IV.**  
Diverticulum of the bladder and a dilated left ureter, filled with Collargol.



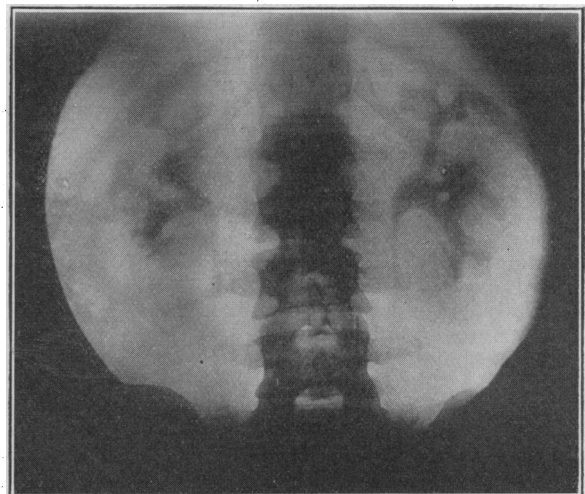
**FIGURE VII, CASE III.**  
Bladder filled with air. Diverticulum and dilated left ureter filled with Collargol.



**FIGURE VIII, CASE III.**  
Photograph of diverticulum removed at operation.



**FIGURE IX.**  
Photograph of kidney tumor removed at operation in Case V.



**FIGURE X.**  
Pyelograms (Thorium nitrate) of Case VI. Show beginning retraction of major and bulbous dilatation of minor calyces which is characteristic of polycystic kidney.



distended with air, which shows large diverticulum, markedly dilated left ureter (and left pyonephrosis, not shown in photograph) (Fig. VII).

Operation, March 20th. Marked pericystitis and peridiverticulitis, it being impossible to strip the peritoneum from the bladder without tearing into it. The bladder wall was stripped up with difficulty and the diverticulum exposed, which had dissected deep posteriorly between the rectum and the prostate. Bladder was opened and slit down to the mouth of the diverticulum, which was removed by a circular incision, care being taken to free the right hydroureter which was adherent to the lateral wall of the diverticulum but opened into the bladder independently. The walls of the diverticulum were markedly hypertrophied as shown in Figure VIII. The bladder was closed with chromic gut sutures, large drains left down to the pouch outside of the bladder and a rubber tube placed in the bladder. Patient's condition was satisfactory, bladder drainage being facilitated by suction pump after the method of Churchman. On the 25th of May, the suprapubic wound had completely closed and the patient was draining altogether through the retention catheter. On the 26th the retention catheter was removed. On the 29th phthalein test, first hour 25%, second hour 12%. Urine was very cloudy and loaded with pus. The suprapubic wound has remained dry for four days and the patient has been voiding his urine per the urethra. On the 31st of May, patient was seized with severe cramp-like pains in the upper abdomen, confined mostly to the epigastrium (he had eaten blackberry pie the day before), and showed moderate abdominal distention. Bowels had not moved for two days. All enemata had been returned clear and on the first of June, patient vomited greenish-colored fluid and complained of more abdominal pain. Blood urea nitrogen 28 mg. per 100 cc. On the 2nd of June the patient's abdominal condition remained unchanged. Bowel movement not obtained. Great abdominal distention. Vomited fecal material for the first time. Eserin had been given hypodermically without effect. Blood urea nitrogen 49.4 mg. per 100 cc. at 1:30 p. m. Operation at 5:15 by Dr. Pope. Incision was made on the left lower quadrant just above the anterior superior spine; 50 cc. of clear straw-colored fluid obtained upon opening the peritoneal cavity. Large mass of adhesions in mid line just below the umbilicus consisting of peritoneum omentum and descending colon. Not possible to bring the colon over to the abdominal wall so that enterostomy was done upon the presenting intestine which was ileum. On June 3rd, the intestine was opened at 6 a. m. and about 600 cc. of greenish-brown fluid escaped. Patient much relieved. On June 7th patient had good bowel movement. On the 10th vomiting and cramp-like abdominal pains occurred, and slight abdominal distention. Bowels had not moved for 24 hours either by enterostomy opening or rectum. No bowel movement by the 14th. Incoagulable nitrogen 90. mg. per 100 cc. on this date (normal 15.). No change on the 17th. Attempt to feed by colostomy openings were unsuccessful. Second enterostomy performed on the 17th of March. The portion of the intestine above the old enterostomy site was collapsed and bleeding, and the intestine above distended. Portions of this distended gut were brought to the surface. Patient gradually grew weaker and died on the 24th of June. Autopsy not permitted. Death from chronic peritonitis, intestinal obstruction and pyelonephritis.

Note: This case has shown pronounced symptoms for 20 years during all of which time the condition was not recognized because he had never had a thorough urological examination. Early recognition again would have saved a lifetime of suffering. The progression to pronounced pericystitis and peridiverticulitis with the forma-

tion of localized peritonitis and intestinal adhesions accounts for the fatal issue.

#### Case IV. Papilloma of Bladder.

T. M. Aet 60. U. C. No. 11912. Admitted August 4th, 1916. Died August 9th, 1916.

Family history and past history, negative. Complaint: Blood in the urine and shortness of breath. P. I. Began nine years ago with burning on urination. At this time there was bright red blood in the urine for three days. This attack cleared up and two years later, or seven years ago, had a second attack in which there was urgency and frequency of urination, with marked difficulty and pain. This urinary disturbance lasted for seven hours, when it practically cleared, but blood persisted in the urine for four days. The pain at the time of urination appeared to be at the base of the bladder and did not radiate. Three months later had burning on urination for three days but very little difficulty or pain on urination. Attacks of this kind have recurred about every three or four months for the last six years. There has been very little pain or discomfort and the attacks have been mostly attacks of hematuria. The last attack started three to four days ago after three months' remission and the bleeding is still present. Urinates every two hours during the day and once at night. Between attacks there is no nycturia; no difficulty in starting urine; no dribbling. For the last two weeks has had shortness of breath on exertion. Worked up until two days ago. Has not felt ill at any time. Has lost about twenty pounds in the last ten months.

P. E. Patient very poorly nourished. Showed marked anemia. Systolic murmur at the apex transmitted to the axilla and also heard over the aortic and pulmonary areas. Abdomen negative. Wassermann negative. Blood on admission showed 20% hemoglobin, 1,628,000 R. B. C.; 10250 W. B. C. Blood pressure 110-90. Urine: Specific gravity 1030 acid; slight trace of albumen; no sugar; no casts; many red blood cells; no pus.

Cystoscopic examination: No residual; bladder capacity 200 cc. The base and sides of the bladder near the vesical orifice are covered by a broad villous and papillomatous tumor. The tumor covers up both ureteral orifices and the bladder wall was seen with difficulty over the tumor and showed trabeculation and some cellule formation. There was no evidence of prostatic enlargement and with the finger in the rectum the beak of the cystoscope could be readily felt in the prostatic notch. There was no thickening between the instrument and the finger. Fulguration treatment advised. Proctoscopic examination shows a papillomatous tumor high up in the rectum. Owing to the low hemoglobin estimation a transfusion was advised and transfusion serum tests were made by the hospital staff. A suitable donor found and the patient transfused. Patient died a few hours after transfusion. Autopsy showed ulcerated, probably benign, polyp of the bladder, small papilloma of the descending colon; marked secondary anemia of all the organs; acute hemorrhagic pancreatitis; chronic diffuse nephritis; hypertrophy of the heart. Gross specimen of bladder saved.

Note: For nine years there was definite indication for a cystoscopic examination in this case. The fatal result sums up the penalty of its neglect.

#### Case V. Hypernephroma.

J. G. U. C. No. 11768. Admitted July 17th, 1916. Operation July 27th, right nephrectomy. Discharged August 13th, 1916. Complaint: Bloody urine and difficulty on urination because of blood clots in the urine.

Family history, irrelevant. Past history, typhoid at 15. No other illnesses. Occupation, salesman for a liquor concern.

P. I. As long as 22 or 23 years ago patient first noticed that his urine would be occasionally blood-stained for a period of two or three days

and this hematuria recurred every two or three months. There was never any pain or discomfort at these times. Eight years ago had a violent attack of pain in the right lumbar region, accompanied with high fever. This pain radiated into the right testis and lasted off and on for about a week, clots appearing at this time in the urine. These attacks of right lumbar pain, and voiding blood clots recurred at intervals of about six months during the next two or three years. Patient has been under continuous medical care during the last five years and has had attacks of lumbar pain and hematuria every two to four months. Between attacks the urine is clear and the patient feels perfectly well. Never passed stone. Was cystoscoped for the first time a year ago with negative findings.

P. E. No palpable lymph glands. Scrotum negative. No varicocele. Chest negative. Abdomen negative except for the increase in area of dullness in the region of the right kidney. On palpation the lower pole of the kidney can be barely felt. No tenderness. The liver edge reaches 4 cm. below the costal margin. Left kidney not palpable. X-ray of long bones and chest negative. Diaphragm apparently not pushed up on the right side. Blood: 85% hemoglobin; 5,200,000 reds, 8,000 W. B. C. Urine: Specific gravity 1022 acid; heavy cloud of albumen; no sugar; no casts; many red blood cells; and a few pus cells; no organisms.

Phthalein test, intralumbar, August 29th, first hour 42%, second hour 14%. September 2nd, intravenous, first hour 55%, second hour 17%. August 11th, first hour 38%, second hour 16%. Blood urea test, July 17th, 324 mg. per 100 cc.

Cystoscopic examination: July 19th. Bladder normal in appearance. Blood stained stream seen to spurt from the right ureter. Both sides catheterized. No flow obtained from the right side, even after repeated injections with sterile water. Capacity of right pelvis about 5 cc., which reproduces pain on the right side. The phthalein failed to appear in 45 minutes on the right side. Appeared on the left side in 5 minutes; thirty-minute output on the left was 10% (probably inaccurate because of imperfect injection into the vein). Microscopical examination showed an occasional red blood cell; rare white cell on the left side and very many red blood cells on the right side. Cultures from the two sides negative. Pyelogram shows a normal appearing left pelvis and ureter. On the right side there are very dim scattered shadows in the kidney region. The right ureter is seen to end at about the kidney region, evidence of considerable pelvic deformity.

Operation, July 27th. A tumor mass approximately five times the normal size of the kidney, the lower pole of which appeared to consist of normal kidney tissue, whereas, the upper four-fifths was composed of an irregular, granular appearing tumor typical of hypernephroma (Fig. IX). The capsule contained many large venous channels, each of which required ligation. Convalescence was uneventful. Patient left the hospital August 13th, feeling well. Was seen September 18th. Had returned to work. The wound was healed perfectly. No pain. Urine clear.

Case VI. R. J. Aet 56. P. C. No. 284. Admitted September 1st, 1916. Discharged September 7th, 1916.

Complaint: Hematuria. Family history, negative. Past history: Has had mumps, whooping cough, chicken pox, diphtheria, tonsillitis, typhoid malaria. For the last few years has had nocturia twice. No difficulty in urination; some burning.

P. I. Twenty years ago first noticed bloody and cloudy urine, which lasted about three months. Six months later had a second attack which lasted only 3-4 days. Since then, about every three months, has had similar attacks of three to four days' duration. Last attack one month ago, up to which he had not had an attack for one year. The present attack began six weeks ago and has been

continuous since the onset. There is no associated pain or discomfort except for the urgency and difficulty in urination because of blood clots.

P. E. Examination: Soft systolic murmur confined to the apex. Blood pressure not taken. The lower pole of the right kidney is barely palpable. The left kidney not felt. Blood count, 68% hemoglobin; 3,800,000 R. B. C.; 12,000 W. B. C. Urine: Specific gravity 1025, acid; small trace of albumen; no sugar; occasional granular casts; many white blood cells; a great many red blood cells; a few epithelial cells. Total phthalein, September 2nd, first hour 42%, second hour 19%. September 6th, ploridzin test, 1 cc. of 1 to 200 solution injected subcutaneously. No reduction of Fehling's solution in four hours. Specimens collected every fifteen minutes through urethral catheter. September 7th, first hour 35%, second hour 15%. September 8th, urea nitrogen 22.9 mg. per 100 cc. Total noncoagulable nitrogen, 13.8 mg. per 100 cc. Cystoscopic examination: Residual 80 cc. Bladder capacity 550 cc. Bladder negative for stone, tumor or diverticulum. Inspection of the vesical orifice shows small anterior and bilateral lobe hypertrophy. Ureteral orifices normal in appearance and the left could be seen to eject a blood-stained stream. No blood seen pouring from the right. Both sides catheterized and both showed, microscopically, many pus cells; several red blood cells; a few epithelial cells but no casts. Phthalein appeared in six minutes on both sides. Half-hour output, 30% on the left, 20% on the right. No leakage about the catheters as determined by the absence of phthalein in the bladder contents at the end of the thirty-minute period. Patient taken to the X-ray room and double pyelography done, 40 cc. being allowed to flow by gravity on each side. Pyelogram (Fig. X) shows marked deformity of both pelvises. The right ureter is dilated and the right pelvis is retracted and deformed. The major calices are retracted and minor calices blunted or obliterated. Opposite the mid part of the pelvis is a small island of Thorium. The left side shows more deformity than the right and simulates the "spider leg" deformity. Two long isthmi of Thorium can be seen leading to the cystic dilatations at some distance from the pelvis, typical of deformity seen in polycystic kidneys.

Note: In the last two cases the significance of hematuria is doubly emphasized. Every case with bloody urine should be regarded as malignant until proven otherwise. For more than 20 years each of these cases gave evidence demanding a thorough urological examination.

## TREATMENT OF ECLAMPTOGENIC TOXAEMIA OF PREGNANCY WITH SOME CASE REPORTS.\*

By EDWARD N. EWER, M. D., F. A. C. S., Oakland, Cal.

By this term is meant the toxæmia which presents some or all of the following signs: albuminuria, headache, disturbances of vision, high blood pressure, epigastric pain, nausea and vomiting, edema and finally convulsions. It has been suggested that accidental hemorrhage may be added to this list, for if eclampsia without convulsions can cause cerebral apoplexy it may be suspected that it can also cause retro-placental hemorrhage. Albuminuria has often been found in association with this variety of hemorrhage.

The enormous mortality when convulsions supervene places this condition at once among our most formidable diseases. The maternal mortality

\* Read before the Alameda County Medical Association, Nov. 14, 1916.